

# [Graphical development of fully executable transactional workflow applications with adaptive high-performance capacity]

## Abstract

Source code of fully executable high-performance transactional workflow application is generated from a graphically produced description of workflow process. Description represents flow of control between activities included in the workflow process and software components providing activities' functionality. Application's executable code facilitates construction of hierarchical trees of objects reflecting specified workflow configuration and controlling flow of execution of workflow-activities, including launch of alternative and parallel streams of execution and synchronization of parallel streams within same workflow request. Application's adaptive high-performance transactional workflow processing capacity is realized by hierarchical structure of threads organized as multitude of autonomous self-contained divisions, being itself hierarchical structures of threads, and a top-level thread. Top-level

thread makes adaptive decisions, based on reports made by threads of lower two levels of hierarchy and on its own assessment of application needs and goals, and executes and supervises adaptive behavior related to allocation and de-allocation of system resources. Threads of self-contained divisions are responsible for workload synchronization and balancing, for scheduling and supervising, and for processing of individual units of work. High-performance workflow processing is additionally supported by implementation of methods for preventing and neutralizing development of software bottlenecks. Real-time visualization of structure, quantity and utilization of threads is provided as indicator of workload and points of delay caused by distributed infrastructure, and for observation and analysis of application's adaptive behavior.